

REMARKS

Claim 1 has been amended in order to correct an obvious typographical error therein. No new matter has been added.

Claims 1 and 4-7 have been rejected under 35 USC 102(b) as being anticipated by Kawamura et al. Claims 1, 3-7, 12 and 16-19 have been rejected under 35 USC 102(e) as being anticipated by Sakaki et al. Claims 1, 4-7 and 6-19 have been rejected under 35 USC 102(e) as being anticipated by Gallucci et al. Claims 3 and 12 have been rejected under 35 USC 103(a) as being unpatentable over Gallucci et al in view of Sakaki et al. Claims 16-19 have been rejected under 35 USC 103(a) as being unpatentable over Sakaki et al in view of Gallucci et al. Applicants respectfully traverse these grounds of rejection and urge reconsideration in light of the following comments.

As explained previously, the present invention is directed to a thermoplastic resin composition comprising 2.5 to 15 wt.% of a styrene-based thermoplastic elastomer and 85 to 97.5 wt.% of tungsten powder and to a thermoplastic resin molded article made of this thermoplastic resin composition. The thermoplastic resin composition of the present invention provides a molded article that is highly flexible and has an excellent processability while still possessing a specific gravity as high as lead and can be used as a material for forming different types of objects requiring both a high specific gravity and flexibility, such as a balance weight.

As discussed in the present specification, the styrene-based thermoplastic elastomer contains hard and soft segments with polystyrene serving as the hard segment and is prepared, as disclosed on page 5, last paragraph, and the first two lines on page 6, by forming a block copolymer. That is, the styrene-based thermoplastic elastomer of the present invention is a block copolymer. Moreover, since the thermoplastic resin composition of the present invention can be substituted for lead in various uses, environmental and toxicity concerns

associated with lead can be avoided. Therefore, the instant invention provides a composition having a high enough specific gravity and appropriate flexibility to be used in place of lead. It is respectfully submitted that the prior art cited by the Examiner does not disclose the presently claimed invention.

The Kawamura et al reference discloses a radiation shielding material in which tungsten powder is dispersed into unvulcanized fluororubber in advance so that the mixture is vulcanized and molded. In the Office Action, the Examiner draws Applicants' attention to Example 4 of this reference which is said to disclose a composition comprising 92% tungsten and 8% styrene thermoplastic elastomer, i.e., styrene butadiene rubber. That is, it appears that the Examiner is stating that styrene butadiene rubber is a styrene thermoplastic elastomer. Applicants respectfully disagree with this position of the Examiner.

Enclosed herewith for the Examiner's benefit is an excerpt from the Practical Glossary for Plastics, provided in Japanese, and a partial translation of lines 8-30 of the left column of page 324. As can be seen from the enclosed translation, a styrene-butadiene thermoplastic elastomer is not the same as styrene-butadiene rubber, SBR. Although the elastomer is made from styrene and butadiene, like styrene-butadiene rubber, this elastomer is a block copolymer, as discussed in the present specification, while styrene-butadiene rubber is a random copolymer. Vulcanization is required for styrene-butadiene rubber but not necessary for the elastomer because crystalline polystyrene portions of the elastomer can act as cross-linking points. Additionally, the elastomer can be easily molded by extrusion, injection molding, etc., as with other general thermoplastic resins. It has other properties such as superior cold-resistance to natural rubber and styrene-butadiene rubber. It also has the defects of less heat-resistance and less solvent-resistance than styrene-butadiene rubber. As such, the Examiner's

statement that the presently claimed styrene thermoplastic elastomer is the same as styrene-butadiene rubber clearly is in error and the Kawamura et al reference neither anticipates Claims 1 and 4-7 nor makes these claims obvious.

With respect to the Sakaki et al and Gallucci et al references, the Examiner states that the Affidavit Under 37 CFR 1.131 is ineffective to overcome these references because the evidence submitted is insufficient to establish diligence from a date prior to the date of reduction to practice of the Sakaki et al or Gallucci et al references to either a constructive reduction to practice or an actual reduction to practice. The Examiner goes on that, specifically, Applicants did not rely upon JP 11-95712 in filing the U.S. application and thus, Applicants have not established constructive reduction to practice.

Enclosed herewith for the Examiner's consideration is page 700-250 of MPEP §71507 which deals with the ways to show prior invention in a 37 CFR 1.131 Declaration. As shown on the enclosed page, if the Declaration presents facts which show the reduction to practice of the invention prior to the effective date of the reference, consideration of the conception of the invention is not applicable.

As stated previously, the Declaration Under 37 CFR 1.131 establishes that Applicants completed the present invention at a date prior to August 27, 1999 and August 18, 2000, the earliest effective U.S. filing dates of Gallucci et al and Sakaki et al. Since the present Applicants were the named inventors in JP 11-95712, which had an application date of April 2, 1999 and claims a thermoplastic resin composition comprising 2.5 to 15% by weight of a thermoplastic elastomer and 85-97.5% by weight of tungsten powder, Applicants clearly had reduced to practice the claimed invention prior to the effective filing dates of Gallucci et al and Sakaki et al and, as such, have effectively established that these patents cannot be applied as references against the present application under 35 USC 102 and 103.

With respect to Claims 16-19, these claims have been rejected under 35 USC 103(a) as being unpatentable over Sakaki et al in view of Gallucci et al. The Examiner states in the Office Action, that, with respect to Claims 16-19, the evidence submitted in the 1.131 Declaration is insufficient to establish conception and reduction to practice the invention of Claims 16-19 prior to the effective date of either Sakaki et al or Gallucci et al, given that the 1.131 Declaration is not commensurate in scope with the scope of Claims 16-19. Applicants respectfully traverse this position of the Examiner.

On page 8 of the English language translation of the priority document, it is stated that the thermoplastic resin composition disclosed there can also contain conventional additives such as anti-oxidants, thermal stabilizers, ultraviolet absorbers, antistatic agents, crystallization accelerators, coupling agents, lubricants, additive stickers, pigments, dyes, softening agents, anti-aging, cross-linking agents or the like. Although the polyester blend of Gallucci et al is different from that of the present invention and the Sakaki et al reference, the metal oxides and sulfates disclosed in Gallucci et al are disclosed there as being conventional additives. Therefore, the subject matter of Claims 16-19 were clearly reduced to practice in JP 11-95712 with the filing date of April 2, 1999. As stated in MPEP §715.02, "Such evidence is sufficient because Applicants' possession of what is shown carries with it possession of variations and adaptations which would have been obvious, at the same time, to one of ordinary skill in the art."

Since JP 11-95712 discloses that conventional additives can be present in the thermoplastic resin composition disclosed there and the Gallucci et al reference discloses that the metal oxides and sulfates added to the polyester resin composition disclosed there are conventional additives, Applicants respectfully submit, at the very least, that it would have been obvious to use the additives of the Gallucci

et al reference with the thermoplastic resin composition of JP 11-95712, if desired.

However, Applicants also wish to point out that there is no motivation contained in the Gallucci et al reference to suggest that the metal oxides and sulfates disclosed there would be suitable as additives in the composition of Sakaki et al.

The Gallucci et al reference is directed to impact-resistant polyester resins having ceramic-like properties, a high specific gravity and enhanced plating properties. To achieve this aim, from about 5 to about 40 wt.% of a polyester resin must be present in the polyester blend composition. An impact modifier, such as a styrene-containing polymer, can optionally be present.

On the other hand, the object of Sakaki et al is to provide a lead-free balance weight for a vehicle wheel having a high specific gravity and proper flexibility. In fact, as disclosed in Column 6, lines 28-31, the resin composition of Sakaki et al is to be flexible enough to be easily bent by hand. Since the object of the Gallucci et al reference is to produce a polyester resin composition having a high impact resistance, one of ordinary skill in the art would not come to the conclusion that a filler which is used in a high impact-resistant resin composition would be suitable for use in a flexible resin composition.

For the reasons advanced above, it is respectfully submitted that the presently claimed invention clearly is patentably distinguishable over the prior art cited by the Examiner. Favorable consideration is respectfully solicited.

Respectfully submitted,



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Encl: MPEP Page 700-250
Excerpt of "Practical Glossary for Plastics" and
Partial English-Language Translation Thereof
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MANUAL OF PATENT EXAMINING PROCEDURE

However, when reviewing a 37 CFR 1.131 affidavit or declaration, the examiner must consider all of the evidence presented in its entirety, including the affidavits or declarations and all accompanying exhibits, records and "notes." An accompanying exhibit need not support all claimed limitations, provided that any missing limitation is supported by the declaration itself. *Ex parte Ovshinsky*, 10 USPQ2d 1075 (Bd. Pat. App. & Inter. 1989).

The affidavit or declaration and exhibits must clearly explain which facts or data applicant is relying on to show completion of his or her invention prior to the particular date. Vague and general statements in broad terms about what the exhibits describe along with a general assertion that the exhibits describe a reduction to practice "amounts essentially to mere pleading, unsupported by proof or a showing of facts" and, thus, does not satisfy the requirements of 37 CFR 1.131(b). *In re Borkowski*, 505 F.2d 713, 184 USPQ 29 (CCPA 1974). Applicant must give a clear explanation of the exhibits pointing out exactly what facts are established and relied on by applicant. 505 F.2d at 718-19, 184 USPQ at 33. See also *In re Harry*, 333 F.2d 920, 142 USPQ 164 (CCPA 1964) (Affidavit "asserts that facts exist but does not tell what they are or when they occurred.").

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II. < ESTABLISHMENT OF DATES

If the dates of the exhibits have been removed or blocked off, the matter of dates can be taken care of in the body of the oath or declaration.

When alleging that conception or a reduction to practice occurred prior to the effective date of the reference, the dates in the oath or declaration may be the actual dates or, if the applicant or patent owner does not desire to disclose his or her actual dates, he or she may merely allege that the acts referred to occurred prior to a specified date. However, the actual dates of acts relied on to establish diligence must be provided. See MPEP § 715.07(a) regarding the diligence requirement.

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III. < THREE WAYS TO SHOW PRIOR INVENTION

The affidavit or declaration must state FACTS and produce such documentary evidence and exhibits in

support thereof as are available to show conception and completion of invention in this country or in a NAFTA or WTO member country (MPEP § 715.07(c)), at least the conception being at a date prior to the effective date of the reference. Where there has not been reduction to practice prior to the date of the reference, the applicant or patent owner must also show diligence in the completion of his or her invention from a time just prior to the date of the reference continuously up to the date of an actual reduction to practice or up to the date of filing his or her application (filing constitutes a constructive reduction to practice, 37 CFR 1.131).

As discussed above, 37 CFR 1.131(b) provides three ways in which an applicant can establish prior invention of the claimed subject matter. The showing of facts must be sufficient to show:

(A) reduction to practice of the invention prior to the effective date of the reference; or

(B) conception of the invention prior to the effective date of the reference coupled with due diligence from prior to the reference date to a subsequent (actual) reduction to practice; or

(C) conception of the invention prior to the effective date of the reference coupled with due diligence from prior to the reference date to the filing date of the application (constructive reduction to practice).

A conception of an invention, though evidenced by disclosure, drawings, and even a model, is not a complete invention under the patent laws, and confers no rights on an inventor, and has no effect on a subsequently granted patent to another, UNLESS THE INVENTOR FOLLOWS IT WITH REASONABLE DILIGENCE BY SOME OTHER ACT, such as an actual reduction to practice or filing an application for a patent. *Automatic Weighing Mach. Co. v. Pneumatic Scale Corp.*, 166 F.2d 288, 1909 C.D. 498, 139 O.G. 991 (1st Cir. 1909).

Conception is the mental part of the inventive act, but it must be capable of proof, as by drawings, complete disclosure to another person, etc. In *Mergenthaler v. Scudder*, 1897 C.D. 724, 81 O.G. 1417 (D.C. Cir. 1897), it was established that conception is more than a mere vague idea of how to solve a problem; the means themselves and their interaction must be comprehended also.

実用
プラスチック
用語辞典

第三版

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プラスチック課

プラスチックス・エージ

スチレン ビーズ styrene beads

小球状の発泡性ポリスチレンをいう。スチレンモノマーを懸濁重合法によってビーズ状の形状に重合させるが、その際、重合過程でブタン、プロパン、ペンタンなどの揮発性発泡剤を圧入して得られる。このビーズを熱水中で予備発泡させた後、金型に入れて成形し、発泡成形品を得る。
△発泡ポリスチレンフォーム

スチレン-ブタジエンゴム styrene-butadiene rubber, SBR

汎用ゴムとして最も多量に生産されている合成ゴムで、ブタジエンとスチレン(50%以下)を乳化重合によってつくる。結合スチレン量20~25%のものは天然ゴムと同様の用途に用いられ、加硫することにより最終製品が得られる。ブタジエンとスチレンの比率、重合条件、油やカーボンブラックの添加量などの違いにより種類も多い。

スチレン-ブタジエン熱可塑性ゴム**styrene-butadiene thermoplastic elastomer**

1965年Shell Chemical社によって開発された熱可塑性ゴム。SBRと同じくスチレンとブタジエンのコポリマーであるが、SBRがランダムコポリマーであるのに対して、このゴムはブロックコポリマーである点が異なる。SBRは加硫が不可欠であるが、このゴムは結晶性のポリスチレン部分が架橋点の役目を果たすため加硫する必要がなく、また一般の熱可塑性樹脂同様、押出成形、射出成形などが容易に行えることが大きな特徴である。ゴムとしての性質も優秀で、特に耐寒性は天然ゴム、SBRよりも優れているが、耐熱性、耐溶剤性に劣るのが欠点である。
△スチレン-ブタジエンゴム

スチレン プラスチック styrene plastics = スチロール系樹脂**スチレン ペーパー styrene paper**

ポリスチレンに発泡剤として低沸点脂肪族炭化水素を配合した、いわゆる発泡性ポリスチレンを押出機にかけてシート状にしたもので、美しい真珠光沢を有し、耐水性、断熱性、吸音性、衝撃吸収性に優れている。エンボスあるいは真空成形されて、各種の包装あるいは使い捨て簡易容器として広く用いられている。
△ポリスチレン発泡体

スチレン無水マレイン酸共重合体**styrene-maleic anhydride copolymer**

スチレンに十数%の無水マレイン酸を混入した共重合体。ポリスチレンに比べて10~20°C高い耐熱性を持つ樹脂である。発泡成形物は自動車の天井用素材などに用いる。無水マレイン酸の多く入ったものはすべて交互共重合体となり、特殊な塗料などに用いる。
△ポリスチレン

スチレン-メチルメタクリレート共重合体**styrene-methylmethacrylate copolymer**

メタクリル樹脂の特長を失わずにその成形加工性を改良した共重合体で、スチレン含有率は30%程度。かつてアメリカでその優れた耐候性と成形性が注目され、我が国でも一時生産された。当時は廉価なスチレンを共重合することによるコスト引下げに意義があったが、その後、メチルメタクリレートの価格低下とともにそのような意義も薄れ、現在は生産されていない。

スチロール styrol = スチレン**スチロール系樹脂 styrene polymers and copolymers = スチレンプラスチック**

次のような一群のスチレン系樹脂をいう。

一般用ポリスチレン……スチレンの単独重合体

耐衝撃性ポリスチレン……ポリスチレンと合成ゴムのポリマープレンド又はグラフト共重合体

ポリスチレン発泡体

AS樹脂……………スチレンとアクリロニトリルの共重合体

ABS樹脂……………アクリロニトリル、ブタジエン及びスチレンの三成分から成る重合体

△ポリスチレン、耐衝撃性ポリスチレン、ポリスチレン発泡体、アクリロニトリル-スチレン共重合体、ABS樹脂

ステアリル アルコール stearyl alcohol

$\text{CH}_3(\text{CH}_2)_{16}\text{CH}_2\text{OH}$ の化学式を持つmp 56~60°Cの白色粉末。アルコール、エーテル、ベンゼン、アセトンに可溶。化粧用原料及び樹脂用滑剤、離型剤として用いられる。

ステアリン酸亜鉛 zinc stearate

$\text{Zn}(\text{C}_{18}\text{H}_{35}\text{COO})_2$ 左記の化学式を持つ白色粉末。滑剤、安定剤として用いる。PVCの安定剤として用いた場合、透明性の良い製品を与え、無毒で、硫化水素にも黄変しない特色を持っている。

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1. Translation of the cover page

Practical Glossary for Plastics

3rd Edition

Editorial supervisor NAGAI Susumu

Edited by Department of Plastics, Osaka Municipal Technical Research Institute

Plastics age

2. Partial translation of lines 8 to 30 of the left column at page 324 of the "Practical Glossary for Plastics"

Styrene-butadiene rubber, SBR

This rubber is a synthetic rubber that is used as universal rubber and produced in a large amount. It is produced by emulsion polymerization using butadiene and styrene (amount of styrene is 50% or less). The rubber containing 20 to 25% of styrene as polymerized units can be used in the same manner as natural rubber. Final product is obtained by vulcanization. There are many kind of rubbers based on the ratio of butadiene and styrene, polymerization conditions, content of additives of oil or carbon black, and the like.

Styrene-butadiene thermoplastic elastomer

This rubber is a thermoplastic elastomer developed by Shell Chemical Co.,Ltd. on 1965.

This elastomer is a copolymer made from styrene and butadiene like SBR. This elastomer is different from SBR in that SBR is a random

copolymer, whereas this elastomer is a block copolymer. Vulcanization is essential for SBR, but is not necessary for this elastomer because crystalline polystyrene portions of elastomer can act as cross linking points. Further, the elastomer has a feature in that the elastomer can be easily molded by extrusion, injection, etc as other general thermoplastic resins. The property as the rubber is also excellent, for example, cold-resistance is superior than natural rubber and SBR. However, defects are less heat-resistance and less solvent-resistance.
⇒styrene-butadiene rubber

3. Partial translation of the publisher's emblem

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